IDRC•CRDI•CIID

Integration of Food Crops, Fisheries, and Nutrition Research in Northeast Thailand

R.H. Young
A.K. Bernard

June 1989

The International Development Research Centre is a public corporation created by the Parliament of Canada in 1970 to support research designed to adapt science and technology to the needs of developing countries. The Centre's activity is concentrated in six sectors: agriculture, food and nutrition sciences; health sciences; information sciences; social sciences; earth and engineering sciences; and communications. IDRC is financed solely by the Parliament of Canada; its policies, however, are set by an international Board of Governors. The Centre's headquarters are in Ottawa, Canada. Regional offices are located in Africa, Asia, Latin America, and the Middle East.

Le Centre de recherches pour le développement international, société publique créée en 1970 par une loi du Parlement canadien, a pour mission d'appuyer des recherches visant à adapter la science et la technologie aux besoins des pays en développement; il concentre son activité dans six secteurs : agriculture, alimentation et nutrition; information; santé; sciences sociales; sciences de la terre et du génie et communications. Le CRDI est financé entièrement par le Parlement canadien, mais c'est un Conseil des gouverneurs international qui en détermine l'orientation et les politiques. Établi à Ottawa (Canada), il a des bureaux régionaux en Afrique, en Asie, en Amérique latine et au Moyen-Orient.

El Centro Internacional de Investigaciones para el Desarrollo es una corporación pública creada en 1970 por el Parlamento de Canadá con el objeto de apoyar la investigación destinada a adaptar la ciencia y la tecnología a las necesidades de los países en desarrollo. Su actividad se concentra en seis sectores: ciencias agrícolas, alimentos y nutrición; ciencias de la salud; ciencias de la información; ciencias sociales; ciencias de la tierra e ingeniería; y comunicaciones. El Centro es financiado exclusivamente por el Parlamento de Canadá; sin embargo, sus políticas son trazadas por un Consejo de Gobernadores de carácter internacional. La sede del Centro está en Ottawa, Canadá, y sus oficinas regionales en América Latina, Africa, Asia y el Medio Oriente.

This series includes meeting documents, internal reports, and preliminary technical documents that may later form the basis of a formal publication. A Manuscript Report is given a small distribution to a highly specialized audience.

La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.

Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.

IDRC-MR228e

INTEGRATION OF FOOD CROPS, FISHERIES, AND NUTRITION RESEARCH IN NORTHEAST THAILAND

An Extract from the Proceedings of a Workshop held in Khon Kaen, Thailand, December 7-9, 1988, available from the Institute of Nutrition, Mahidol University, Thailand

by

Richard H. Young
Coordinator, Nutrition Unit
Agriculture, Food and Nutrition Sciences Division
International Development Research Centre (IDRC)
Ottawa, Canada

and

Anne K. Bernard
Senior Program Officer
Fellowships and Awards Division
IDRC, Regional Office for Southeast and East Asia
Republic of Singapore

Material contained in this report is produced as submitted and has not been subjected to peer review or editing by IDRC Communications Division staff. Unless otherwise stated, copyright for material in this report is held by the authors. Mention of proprietary names does not constitute endorsement of the product and is given only for information.

90-00248/

TABLE OF CONTENTS

	Page
THE PROBLEM	1
NUTRITIONAL DEFICIENCIES AND INTERVENTIONS	2
AGRICULTURAL SITUATION	4
SIGNIFICANCE OF FISHERIES	9
RESEARCH PRIORITIES : GROUP RECOMMENDATIONS	14
THE OUTCOME	22
THE COLLABORATIVE PROCESS : OBSERVATIONS ON WORKSHOP DYNAMICS	25

THE PROBLEM

Although considerable advances have been made in upgrading the nutritional status of the rural population of Thailand, particularly through the government rural development program, deprivation and malnutrition continue to exist in the northeastern provinces. This region may be targeted for a nutrition improvement focus, given the inferior health, nutritional and socio-economic status of its rural inhabitants. Several national and international programs have recognized this fact, resulting in the emergence of various development efforts directed at this region. Interventions in the agricultural, fisheries and nutrition sectors have formed a major part of these efforts. So far, however, there has been little inter-institutional collaboration nor coherence between individual projects. In the area of nutrition, programs to date may not have fully addressed the complexity of factors affecting nutritional status at community level. On the other hand, activities to improve fisheries and agricultural systems have not articulated or measured nutritional effects within their objectives. If a more coordinated approach between the different sectors could be achieved, there would be a greater likelihood of impact to improve the nutritional status, health and well being of the rural people of NE Thailand.

To assist in catalyzing such coordination, a workshop was convened in Khon Kaen with the following objectives:

1) To articulate the various linkages between agriculture, fisheries and nutritional improvement;
2) To determine requirements for additional knowledge and identify entry points for further research and training;
3) To formulate a program for collaborative, inter-institutional support for nutritional improvement in the NE region.

The workshop was organized and conducted by four national institutions - Institute of Nutrition Mahidol University (INMU), Khon Kaen University (KKU), Ministry of Agriculture and Cooperatives (MAC) and Ministry of Public Health (MOPH) - and sponsored by the International Development Research

Centre (IDRC). The workshop program and list of participants are provided in Appendix 1. In addition to the inter-institutional nature of the workshop, a wide range of disciplines were represented from the nutritional, agricultural, fisheries and social sciences.

NUTRITIONAL DEFICIENCIES AND INTERVENTIONS

In the northeastern region of Thailand, vulnerable groups - pregnant and lactating mothers, infants and children - may be unable to satisfy their nutritional requirements from the daily diet. Attitudes, habits and beliefs exacerbate the problem, particularly in the case of pregnant women. Adequate knowledge of nutrient needs is generally lacking and restriction of nutritious foods occurs during pregnancy. The latter problem is especially serious in NE Thailand and is thought to arise from fear of childbirth. The new-born infant is not given colostrum and immunity suffers. While breast-feeding is practised by the vast majority of rural women, bottle feeding also occurs with implications for hygiene. Supplementary feeding regimes are inappropriate. Feeding of solids may commence as early as 3 days post-partum, the food comprising rice and banana. This food is inadequate for growth during the 6 month - 2 year period, however, and body weight falls below normal levels at 6 months of age. Later, height is affected causing permanent stunting. Prevention of malnutrition must therefore be initiated in-utero and continue, particularly during the formative years.

Nutrient deficiencies in the region follow the usual spectrum in poor societies. These predominantly include calories, iron, and iodine. Energy gaps are notable in preschool children and there is an overall need to increase the calorie density of the local diet. Anaemia may affect approximately 80 percent of pregnant, rural women. In view of the low consumption of foods of animal origin, few dietary sources of iron exist and, in these, iron availability is poor. Severe and prolonged iron deficiency results in impaired cognitive functions and reduced learning capacity. In pregnant women, the condition may influence brain development in the foetus. Iodine deficiencies are prevalent in the north and northeastern provinces, probably affecting 20 percent of the population.

The various manifestations of iodine efficiency include goitre (enlarged thyroid), hypothyroidism and cretinism, which produce defects in motor function, hearing and intelligence. The diminished nervous system development in the foetus of women suffering cretinism is irreversible. Iodization methods represent a subject of concern to Thai nutritionists and, here, increased marine fish consumption could have a major impact on nutritional status. Marine fish are good sources of iodine.

Past nutrition intervention programs in Thailand have been quite successful. Third degree malnutrition in infants has been almost completely eradicated. Nevertheless, further improvements are required. To date, curative measures have been introduced to combat malnutrition. These involve establishing community hospitals, providing nutrition coupons for specific foods and systems of rural nutrition volunteers. Case studies in the northeast indicate, however, that infant and child nutrition improves on hospitalization but deteriorates on return home. Emphasis should therefore be redirected to preventative measures to offset malnutrition. In this process, there will be a need to focus on behaviour.

Nutritional and health status closely interact and are conditioned by social and economic pressures. Thus, food prices, purchasing power, agricultural production, marketing systems and other socio-economic determinants are important factors influencing nutrition. Intervention programs should incorporate economic and social objectives if sustainable improvements are to be achieved. To effectively pursue such objectives, a rapprochement between science and sociology is required. In the past, sociologists have not worked with nutritionists. Nevertheless, considerable opportunities exist for establishing such collaboration. Appropriate areas include the following:

- determining the rationale for taboos and lifestyles which affect nutrition and designing education programs for change;
- determining the reasons for changes in practices over the years;
- evaluating discrepancies in national policies which may undermine the achievement of nutritional wellbeing;

- understanding household income allocation and spending behaviour;
- evaluating the influence of market forces;
- establishing viable management of food production, distribution and consumption systems.

A practice of particular concern in the northeastern provinces is the traditional consumption of raw foods. Because of this practice, parasitic infections such as hookworm, giardia and intestinal fluke, are endemic in the region. These infections are responsible for malabsorption of nutrients in the body which in turn exacerbates specific nutritional diseases such as anaemia. Again, it is thought that behavioural alteration through education and effective communication would be the key to ameliorating this undesirable practice. At the same time, it is recognised that food habits established over generations are the most difficult to change.

AGRICULTURAL SITUATION

NE Thailand is an infertile region with sandy soil. Although partially irrigated, the region is predominantly rainfed and farmers harvest one crop annually. Family food supplies are obtained by means of three activities - production, gathering and purchasing. Family food intake, however, is strongly influenced by overall income which, at less than 8,000 THB/family/year on average, is among the lowest in the country (national average 20,000 THB/family/year). The region is also characterized by the most rapid rate of population growth in the country.

Local foods may be classified as follows:

A. Crops
- 1. Rice
  - glutinous
  - ordinary (for sale)
- 2. Vegetables
  - after rice harvest
  - backyard garden
- 3. Fruits (mainly backyard gardens)
  - banana, tamarind and others

B. Livestock 1. Buffalo) Draft
Cattle)
2. Swine - for sale
3. Poultry, chicken, eggs - for home and sale

C. Fishery 1. Paddy fields)
2. Communal ponds) for home and sale
3. Others - river, dams etc.)

Rice accounts for 80% of calorie intake in the region. Fat consumption has increased over the past few years but is still extremely low by national standards - approximately 7% of total calories, the recommended level being 30% With the heavy emphasis on paddy farming, households devote insufficient time to cultivating vegetables and fruits. Moreover, given the low family budgets, there is little purchase of these crops. Although poultry is produced, problems arise due to infestation and diseases causing high stock mortality. With regard to fisheries, small fish are usually reserved for home consumption while large fish are sold. Increasing the home consumption of quality fish would be most beneficial in a nutritional context. Here, improved preservation techniques and education will be important.

Gathering of food is commonly practised but its impact on nutrition is difficult to assess. There is considerable variation in food items gathered depending on the season. During the wet season, fish, frogs, snails and shrimps are available whereas, in the dry season, insects, vegetables and fruits are collected. Together with changes in agricultural production, this results in a wide distribution of food consumption patterns by season. Consequently, variations in nutritional risk are likely throughout the year. Further knowledge on these variations is required. There is also concern that mould growth and mycotoxin contamination of food products during the wet season may have implications for health and nutritional status in the region. Of further significance is the effectiveness of community storage practices in maintaining food availability and ensuring food security. This may be a particularly

important area of attention for the rainfed regions. An evaluation of traditional storage techniques and seasonal effects on food availability and quality would provide valuable information for nutrition policymaking.

Food processing could potentially represent an appropriate means of creating much needed employment and income in the region, with indirect effects on nutrition. The development of small food enterprises, however, is precluded by the shortages of marketable surpluses and raw materials for processing. These are the main reasons for the relatively low investment in the region by food processors. Given the focus of the farming system on rice, other crops would have to be cultivated outside the rice planting and harvesting season. Opportunities do exist for processing and marketing of crops such as tomatoes, baby corn, mushrooms and asparagus. High demand for processed forms of these crops has been established. Nevertheless, in addition to variability in supplies, the quality of these crops is often inadequate for processing. From a nutritional standpoint, promotion of the dairy industry is important but the development of this sector in the region is gradual. The production and slaughtering of livestock is substandard and unable to form the basis of a viable industry. Thus, industries based on rice processing, i.e. milling and tapioca manufacture, are the predominant agroindustries. Other food products from rice may also be effectively developed, e.g. noodles, and should be considered for industrial manufacture in the region. Notably, technologies designed and tested at Khon Kaen University for groundnut stripping and shelling are now being successfully transferred to local farmers. These technologies are enabling rural families to increase their income through the sale of groundnut products.

Discussion at the workshop highlighted the limitations in water supplies and irrigation facilities as obstacles to agroindustrial development. It was also emphasized that labour-intensive food industries are required to have maximum impact on the problem of migration from the region. Migration is a socio-economic phenomenon that has many consequences, including nutritional risks for infants and other family members. Production and processing sectors need to be synchronized for optimum economic performance and employment generation. The possibility of subcontracting the production of

raw materials for industry to small farmers was mentioned as an option for encouraging integrated production and utilization systems. It was also thought that, to stimulate market-driven agroindustries in the region, opportunities for export should be investigated. Given its proximity, Laos was quoted as a possible target for products from NE Thailand, although low purchasing power of the Laotian population may prevent the development of a viable export market. Concerns were expressed, however, over the potential negative effects of the commercialization of agriculture. There is little evidence to indicate that increasing family incomes has direct nutritional benefits. A focus on cash crops may distract attention from food crops important for family health and nutrition.

The effects of any transition in agricultural practices need careful assessment through research. Key factors to take into account will include income allocation behaviour and relative propensity to spend additional income on foods. No studies have been conducted on the influence of civilization on rural household behaviour and spending. It is likely that variations exist between different villages. Anthropological studies to evaluate such behavioural patterns would indicate the need for, and assist in designing, nutrition education programs. Overall, the view prevails that nutrition education programs should operate alongside any schemes to generate additional income for the poor. To underpin other system improvements, good management of agriculture is required with appropriate land division and balanced production of food and commercial crops.

In proposing and implementing improvements in agriculture and nutrition to benefit the poorer, farming families of the northeast, the type of research methodology adopted will be crucial. The roles of farming systems research (FSR), rapid rural appraisal (RRA) and rapid assessment procedures (RAP) were reviewed at the workshop. All these techniques may be used to gain a broad understanding of the array of factors affecting agriculture and nutrition, to encourage farmer participation in problem resolution and to develop a framework for multidisciplinary research. FSR has emerged following previous emphasis on green revolution strategies in agriculture and seeks to achieve preservation of natural resources and sustainable

agriculture. The methodology recognises farmers' knowledge, learned from tradition, and systematically assesses problems and solutions with farmer involvement. It hinges on integrated work by multidisciplinary teams and stresses analysis based on human ecology and agroecosystems.
"RRA in rural development-related research and RAP for nutrition and primary health care research are both newly emerging methodologies for a process of learning and the acquisition of relevant information in a limited period of time. Both share the new paradigm that rests on the view of the world as composed of a highly interactive and rapidly changing system, and the balance and interaction between the epic and ethic from anthropological points of view. Both RRA and RAP also represent a response to a long yearning for improving the cost-effectiveness, timeliness and quality of field research; to practical resource limitations (scarcities of skilled manpower, money and time); and to the lack of holism and limitations of conventional surveys.

The similarities of RRA and RAP include that they are systemic methods of obtaining new information in a relatively short period of time using semi-structured interviews and direct observation; that interviewees are not necessarily chosen randomly but using more of the key informants; that they give priority to substantial use of indigenous knowledge and the opinion of the local people or the epic perspective; that the purpose is usually a problem-focus as a tool for diagnosis and evaluation; that they complement the role of both cross-sectional and longitudinal studies that may show cultural and contextual biases; and that both are inappropriate where representativeness which requires data based on random sampling is an important issue.

However, RRA is more interdisciplinary adopting from many different fields, such as sociology, anthropology, geography and journalism; whereas RAP is more anthropological and the rapid assessment of human behaviour. RRA is also more triangulated seeing different perspectives and stratifying to improve the understanding of variation, and highly iterative allowing the abandonment of the earlier hypotheses and the adoption of reformulated ones based on new information. Moreover, RAP has a younger history and aims

mainly to improve understanding of the successes and failures related to the implementation of primary health care and related research.

RRA and RAP should resist pressures to be standardized and remain a developmental process of information acquisition which allow diversity to flourish, and thus knowledge to be discovered and refined. Both should also avoid the pitfalls of a fashionable fate and the danger of being objects of unrealistic expectations and development research panacea."[1]

FSR, RRA and RAP are examples of evolving, qualitative research techniques that deserve greater consideration as tools for nutrition programming and problem definition. Given the prior experiences with such techniques in the agricultural domain, they may be used to create the common framework required for various disciplines to collaborate in defining the broad causes of nutritional problems. Moreover, a more adequate rapport between researchers, interventionists and the malnourished would emanate from the adoption of these qualitative methodologies.

SIGNIFICANCE OF FISHERIES

Fish is a key commodity in northeast Thailand. Given the extensive paddy cultivation, and presence of reservoirs and ponds, there is appreciable scope for increasing fish production in the region. Lack of fish supplies at certain times of the year limits the adequacy of the rural diet, which depends on fish for protein and essential vitamins and minerals. Marketing of fresh fish, preservation by traditional fermentation processes and marketing of fermented fish products are major elements of the food system which provide income for the poorer sectors of the community.

The Fisheries Department of the Ministry of Agriculture and Cooperatives (MAC) operates locally from various stations and supports nine projects in the northeastern region, the principle aim being to increase fish production for home consumption. The projects include:

1. Village fisheries - to promote fish farming by schoolchildren and increase fish yield from natural waters.

2. NE Fisheries Development Program MAC/CIDA
   - research and promotion of fish farming.

3. Breeding program.

4. Development of fisheries in villages of Thai/Laos border.
5. Development of fisheries in villages of Thai/Cambodia border.

6. Agricultural development using rainwater
   - rice/fish production in rainfed lands.

7. Fish farming and pond aquaculture.

8. Fisheries Development in very arid areas
   - pond aquaculture.

9. Natural water resource conservation (Thailand/Japan).

The NE Fisheries Development Program, supported by CIDA, involves inputs to fisheries management, institutional support, technology, extension and training. Technical areas of interest include optimal growth development, utilization of hormones, sex reversal and fishery engineering. The economic implications of fisheries development are also being explored. A noteworthy area of activity is that of promotion of fish farming and education through media such as radio and video. Improved nutrition is an aim of these communication schemes. In addition, the school fisheries program encourages families to grow and consume fish. The progress of this program is also

being disseminated using novel communications techniques.

Rice-fish farming systems are of particular importance in the region, both in nutritional and economic contexts. Of the 27 m. rai of paddy fields in the northeast, 5m. rai are irrigated and suitable for fish farming. The traditional nature of farming in the northeast, and low use of pesticides, is conducive to fish growth. Although this practice is traditional, it has not been well developed. Documentation and promotion of fish farming by the MAC commenced three years ago. Farmers have been advised to deepen irrigation canals to permit fish farming. However, machinery is required for this operation. Funds provided by CIDA and ADAB have therefore been used to subsidize the cost of machinery. Farmers merely pay a nominal "field price". Fish farming activities begin in August and fast growth is required for timely harvesting along with paddy. The keeping of livestock to provide manure is also encouraged. By-products from farming (e.g. rice bran) may be used as supplementary feed material. Following the paddy harvest, fish normally reach harvesting size prior to drying of the paddy field. Sometimes, however, full growth is not achieved.

In 1986, a total of 4,500 farmers in the region produced approximately 1,000 ton. of fish on 17,600 rai of land. The catch was valued at 25m. THB. It is currently estimated that the number of fish farmers in the region has increased to 10,000. Clearly, rice-fish systems have nutritional significance in making high quality animal food available for family consumption. In addition, farmers are recognizing the fact that fish increase rice productivity by assisting the ecology of the system. Fish manure is good organic fertilizer for rice and fish movement promotes growth of the rice plant. Current problems are related to management and promotion rather than technology. Fish farming necessitates more work and different preparation of the field. The farmer also needs to travel and spend time obtaining fry. Improved fry distribution, and availability of machinery for field preparation, would allow more rapid adoption of rice-fish systems.

The workshop discussion on rice-fish farming signalled the dubious economics of the system given the substantial government subsidy required for field

preparation. The revenue obtained through sale of fish may be inadequate to break even and the reason why farmers are reluctant to adopt the technology. Again, the issue of growing fish for sale, rather than home consumption, raises nutritional questions. Moreover, the likelihood of nutritional problems is greater in rainfed areas but the focus of rice-fish farming activities is generally outside these target areas. The significance of rice-fish systems in nutritional terms may become more apparent following qualitative, problem identification studies in different communities, as discussed in the previous section.

The post-harvest fisheries sector may be particularly important for employment and income in the region. Studies undertaken by the Institute of Nutrition Mahidol University have shown that household producers of fermented fish products (e.g. pla-ra, pla-som) generate reasonable profits through the process. There appears to be scope for improving the acceptability and marketability of low-salt fermented products by better standardization of the process. Overall, fermented fish product systems could play a role in generating further income for the poor in the northeast, as well as offering a simple means of preserving fish for consumption. Improved linkages to fisheries production projects should be developed, however, since in species selection consideration of fish suitable for fermentation is generally lacking.

While the presentations and discussion focussed mainly on fish production in the region, the significance of marine fish transported into the northeastern provinces was also noted. The products are invariably dried and salted, these being among the cheapest and most acceptable forms of processed product in Thailand. Further attention should be devoted to developing and implementing simple drying technologies for fish preservation in the region. At the same time, economic studies are required to compare the cost effectiveness of different subsidy options. For example, while machinery for field preparation to farm fish is heavily subsidized, importation of low-cost fish products to the region may not be adequately encouraged by government support. Nevertheless, the latter may result in a greater impact on nutritional improvement, particulary if linked to seasons

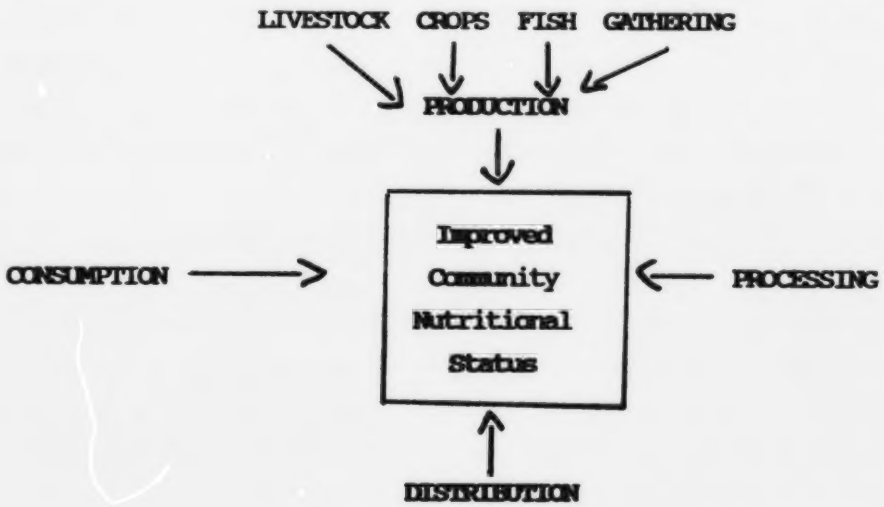
of higher risk, and more efficient use of public resources for human welfare. Thus, the relative costs and benefits of the various options for government intervention in agriculture, fisheries and nutrition may require more rigorous assessment.

RESEARCH PRIORITIES : GROUP RECOMMENDATIONS

Following the formal presentations and discussions, two small groups of participants were convened. Based on the workshop deliberations, each group was to determine research priorities for nutritional improvement in NE Thailand and propose the possible elements of an integrated research program to contribute to nutrition problem resolution in the region. The points listed below outline the recommendations of the respective groups.

GROUP 1

This group analyzed gaps in knowledge and future research priorities in the context of the food system at community level. This may be diagrammatically represented as follows:



Researchable issues were considered for each component of this system, viz:

Production

- Low food availability / poor quality
- Cash vs food crops : effects of commercialization
- Significance of gathering vs farm production

- Deforestation effects on natural food availability
- Role of fish in rainfed vs. irrigated areas
- Fish/crop management: seed/fry availability
- Seasonal variation and nutritional risk
- Influence of government policy on production
- Increasing calorie/nutrient density of local diet

Distribution:

- Income generation vs. food for family
- Food acquisition behaviour and income elasticity on foods at village level
- Intra household food distribution
- Marketing systems within region: surplus --> deficit areas
- Imports of commodities, e.g. fish products, to region
- Significance of government support, subsidies
- Operational research to improve community food distribution; community organizations e.g. temple
- Food perishability; storage, post harvest losses, community food security (effect of seasonality)
- Influence of migration/labour patterns
- Effectiveness of nutrition intervention programs; delivery, management; supplementary foods for vulnerable groups; priorities for specific, targetted intervention

Processing:

- Improvement of quality and availability of food at community level
- Adaptation of existing technological knowledge to local tastes and habits
- Use of market research to determine community preferences and demand
- Upgrading traditional processes to improve quality, safety and marketability
- Differentiation of processing for preservation/food security and processing for enterprise development and income generation
- Operational research to determine opportunities and requirements

for creation of small agroindustries

- Analysis of "export" markets

Consumption:

- Influence of knowledge on food practices; need for education
- Taxonomy of family food beliefs and behaviour; determination of causal web; social prestige effects ("we know what they do but not why they do it")
- Development of educational/communications material to modify behaviour
- Socio-economic/lifestyle pressures on consumption
- Special significance of food restriction and other negative practices during pregnancy
- Improvement of infant supplementary feeding practices
- Utilization of food by individual; hygiene/sanitation; food safety; infections; significance of raw food consumption —> educational programs
- Policy development for alleviation of iron and iodine deficiencies

Research methodologies and management were also discussed. It was agreed that, in addressing the problem areas defined, qualitative research methodologies should receive much greater attention than has been the case hitherto in the nutrition field. A requirement for training in appropriate methodologies was acknowledged. With regard to management of an integrated nutrition research program for the northeast, it was recommended that a collaborative and formal network of government and academic institutions be formed to elaborate and execute the program. This could represent a single project, with one institution acting as executing agency and steered by an inter-institutional committee, or a series of integrated projects operated by individual institutions.

children and pregnant and lactating women. A series of problem issues affecting these groups was then developed, as follows:

- **Low socioeconomic level : rural poor.**
. Income & source of income
. Education (nutrition & health)
. Natural resources
. Land ownership
. Size of family
. Migration
. Hazard environment
. Modernization
. Nutrition and health status

- **Social Culture**
. Food belief and habit
. Politics
. Community organization and activities
. Institutional arrangement
. Social status
. Effect of social culture on new technology
. Current practices (that affect nutrition)

- **Political**
. Community leader (official & nature)
. Local M.P and local decision maker
. Policy & program at national and local level

- **Infrastructure and support services**
. Physical structure
  - market
  - school
  - temple

. Support (credit delivery)

(credit farmers —> bank)

- Behaviour of change agents
. Teacher, monks, health volunteer, rural development officers, agricultural extension officers, fisheries officers, home economics officers.

The group proceeded to elaborate the components of several research project examples to address these problem issues:

Topic I Effect of Government Food Policy/Programs on Nutrition

1. Target Group : Rural Poor

Baseline data

1.1 Nutritional status

1.2 Factors affecting behaviour

1.3 Existing food distribution, processing, production system (Macro & micro)

1.4 Evaluation of existing data

2. Nature of policy

2.1 Policy origins

- Where does it come from and who
- Understanding of program by policy makers
- Motivation of policy makers

2.2 Where is it articulated

- Plans
- Laws
- Programs

2.3 Implementation mechanisms

- organizations, credit, etc.
- Delivery systems
- Limitation on role/function of participating agencies

3. Change agents

3.1 GOV and NGO

- Qualification/background experience

3.2) Recruitment

3.3) Understanding of policy interpretation

3.4) Agreement/disagreement

3.5) Motivations/incentives

3.6) Factors affecting behaviour

- institutional
- socioeconomic

3.7) Target groups trust/confidence in change agents and factor affecting

3.8) Nature of behaviour

Topic II Effect of Migration and Modernization on Food Consumption Pattern

1) Who are the affected sector?

a) people who migrate

- educated/trained

b) people left behind

- preschool and school children
- grandparents
- others
- mid-groups
- illiterate/untrained

2) Stratification scheme of sample respondents

- sex
- education/training
- income levels/occupation
- landownership
- family size/structure

3) Factors affecting migration
   - alternative job opportunities
   - existence of rural based industries
   - available existing resources (land, water, crops, manpower, financial, raw material etc.)
   - labour-recruitment scheme
   - population
   - family values/attitudes/preferences
   - communication, perceptions quality of life, etc.

4) What are the consequences/impact of this
   - income effect
   - labour effect
   - production effect
   - welfare/equity issue
   - socio-cultural effect
   - consumption behaviour/pattern
   - nutrition and health status
   - impact on family ties/values/relationship (e.g. divorce, temporary separation, etc.)

Topic III Integrated Program For Increasing Fish and Fisheries Products Consumption
Baseline Studies

1) Evaluation of current situation
   - organizational structure : who, what tasks and responsibilities
   - relationships between & within groups
   - activities

2) Study fish consumption behaviour (anthropologists, sociologists)
   - intra family distribution
   - seasonal variation
   - traditional processing

3) Distribution & marketing of fish & fisheries products

4) Pattern of utilization in community level and national level.

Implementation

1) Establish effective linkages between collaborative agencies
2) Development of suitable processing methods
3) Promote distribution and utilization outreach to the target population
4) Study of effective communication methods for various target audiences
5) Training of communication methods to various levels of trainers.
6) Promote income generation from surplus fish
7) Monitoring and built-in evaluation of the implementation program

THE OUTCOME

As a result of the final plenary discussion, the following conclusions and recommendations were made:

- Future agricultural, fisheries and nutrition research programs in the northeastern region should focus on the community and community problems, rather than promote purely technical developments.

- Qualitative and quantitative methodologies which can accurately identify causative factors in malnutrition should be adopted and further developed.

- Secondary nutritional data should be further collected and examined to assist the identification of gaps and needs and provide material for establishing a relevant data base.

- Research is also required to define and better understand factors external to the community, e.g. government policy, on nutritional status.

- The special significance of nutrition education in generating improvements in community nutrition is recognized. Educational programs should be based on anthropological data defining behavioural patterns and underlying causes.

- An interdisciplinary research framework should be formulated to: i) determine and/or improve nutrition interventions, ii) create awareness of government policy effects, iii) generate community participation in problem resolution, and iv) link to action programs.

- Training in qualitative research methodologies for nutritionists should be developed and, possibly, coordinated by the Rural Development Institute (RDI) at Khon Kaen University and INMU.

- An inter-institutional Nutrition Group should be formed with the following objectives:

  i) to devise an operational research program based on the workshop results,
  ii) to continue interdisciplinary dialogue and information exchange,
  iii) to act as a forum for exposing and analyzing research results,
  iv) to act as a mechanism for follow-up and continued development of nutrition research.

- The Nutrition Group will comprise representatives from a network of relevant institutions, given below:

  Institute of Nutrition Mahidol University
  Khon Kaen University
  Ministry of Agriculture and Cooperatives
  Ministry of Public Health
  International Development Research Centre

  To encourage effective utilization of research results, implementing agencies, NGO's and policymakers will be incorporated in the Group. Appropriate representatives are to be identified. The Group will have an interdisciplinary character, consisting of specialists from the social, nutritional, agricultural and fisheries sciences.

- The Nutrition Group will consider the following key areas as major components of an integrated nutrition research framework:

  i) Problem identification methodologies
  ii) Food supply and food security
  iii) Food utilization (hygiene and sanitation)
  iv) Nutrition education

v) Food policy
vi) Socio-economics and micro-analysis
vii) Strategies for program implementation
viii) Training

- While initially focussing on problems of NE Thailand, the work of the Nutrition Group should become relevant to other regions and countries as a nutrition research management approach. Ways of expanding the network will be considered at an appropriate stage.

- The Nutrition Group will meet regularly in either Bangkok or Khon Kaen, commencing February, 1989.

THE COLLABORATIVE PROCESS : OBSERVATIONS ON WORKSHOP DYNAMICS

To effect valid utilization of nutrition research for the benefit of the malnourished, management of such research becomes equally important as the actual topics researched. This workshop represented the initiation of a more innovative management process for nutrition research, focussed on a region deserving further attention - NE Thailand. As such, it may be appropriate to evaluate the effectiveness of the workshop in facilitating interdisciplinary collaboration and integrated management of nutrition research.

The workshop was valuable in stimulating a range of questions and seemed to begin breaking down some old assumptions. The small group and plenary sessions were especially useful in allowing a relatively active consideration of nutrition as a complex of social, psychological and biological factors as well as a research, development and policy issue. It also became clear that nutrition is not a problem that will be "solved", as such, through more knowledge or better intervention programs. The experiences presented by the different programs simply served to reveal further questions and new problems; the fact that the social, economic, health and agricultural environments of nutrition (at both macro and micro levels) are continually shifting ones; and that nutrition itself is an evolving phenomenon requiring research and development strategies that are themselves evolutionary, interactive and iterative. The inclusion of the social sciences dimension, was particularly useful. In addition to the theoretical and methodological points made by the social scientists, the nature of their questioning was helpful in facilitating the cross-sectoral exchange and in underscoring linkages.

Among the several possible topics raised for future collaborative research, two that have good potential for allowing a reasonably well-bounded, while at the same time sufficiently inclusive, framework are those dealing with people's own perceptions of what nutrition means as a functional concept in their lives and those dealing with policy analysis. Both cover the spectrum of disciplines concerned with food availability, use, quality and

distribution; both begin from a concrete "problem" orientation; both are central to the design and application of more relevant, accurate and locally acceptable/sustainable interventions; and, to the extent that either is ignored by any of the disciplines or sectors involved, headway toward the remediation of nutritional deficits can only be limited.

While progress was made in the workshop toward highlighting the potential value of an integrated approach to nutrition it is likely that, before any steps are taken to act integratively, much more will need to be done to instil in people the conviction a) that integration is necessary and b) that it will have some concretely discernible benefit for their own work -- that it will, in other words, "make a difference". As is well known, collaboration sounds beneficial in theory but is difficult to operationalize and harder yet to motivate simply through appeals to some vague "better product". How, specifically, will it help the biologist if she/he works jointly with the social scientist, or the agriculturalist with the educator? Is integration good for all aspects of a study or intervention or only for particular components? Can it be done effectively at the level of the individual, and on an informal basis; and where, when and why might it require a more cumbersome, but also perhaps more permanent and impact-producing, institutional affiliation?

There are probably a number of specific things that could be done to begin the process of motivating integration. One of these, of course, is by providing a mechanism or activity around which the different sectors can come together in a common cause. This will be a function of the Nutrition Group emanating from the workshop. Other functions should evolve. It could, for example, undertake an advocacy role vis-a-vis the media and government; conduct a small grants research program for specifically integrated studies; or organize training sessions in cross-disciplinary designs and methodologies. None of these activities would necessarily result in those researchers/intervenors themselves doing more integrated work. Each would, however, being to raise the status and profile of nutrition as a multi-dimensional issue requiring similarly multi-dimensional responses. And as the network beings to meet around the task,

undoubtedly possibilities for joint work would soon emerge — as even started to occur in the very brief and relatively non-interactive forum of this workshop.

The suggestion of some form of training being developed through the RDI is a particularly relevant one. Important here will be that the training is as specifically focussed as possible, in terms of both content and participants. An introduction to socio-cultural theory and social science research design for the physical and production scientists might provide a good start for them to look at their respective fields from the perspective of the food user. Other issues that the network might look at include:

- the gaps or inadequacies in current data that could be improved through integrated collection or analytical procedures. If the present profile or understanding of nutrition is too segmented to allow for effective remediation, can a more collaborative approach to data collection and analysis present a more comprehensive interactive picture? Where is the need for new such data? Where is the need for better, more holistic, analysis of current information? Can all relevant data be brought together into a common clearing-cum-analysis venue? And what are the training requirements for researchers in the different fields if they are to work with data in an integrative way?

- the currently operating intervention/supplementation programs in the country that relate in some way to nutrition. Who is conducting such programs? Whom are they intended to serve and how? And how effective are they? The workshop discussion revealed that there are many programs being run that either are, or could be, related to nutrition but which are not effectively serving this end because they do not see it as relevant or as a need; because of insufficiently clear objectives; or because they are operating in isolation from other related programs. Health, Education, Interior and Agriculture are all Ministries with a myriad of outreach activities aimed at some form of community development/change; when

NGO's are considered as well the scope for a comprehensive nutrition "thrust" seems considerable. The need is for a better idea of what and where these programs are; to evaluate their goals, methods and potential in terms of nutrition; and then to begin to consider where more purposive focussing and/or linkages might be effected.

- related to both of the above, desegregate the discussion on nutrition. There is a need to clarify more explicitly where new knowledge per se must be generated; where existing knowledge must be moved into more and more appropriate hands; and where knowledge itself is not the issue, but rather the need to change attitudes or behaviour at the community or program delivery level using existing knowledge of more appropriate food use. This may be a self-evident point, but the discussions indicated considerable mixing of the three issues such that some same questions or approaches were being perhaps overly addressed while other critical ones were ignored. Perhaps this is a function of people being too much bounded by their particular sectors; one can become too much involved in fine-tuning his/her own project area without realizing that the problem has actually shifted to another sector. In this regard, the value of more collaboration is clear, if only at the level of information exchange. It is expected, however, that the eventual output of this workshop will be genuine collaboration, not only in information exchange but also in research program design, execution and implementation.